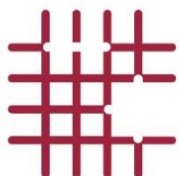


Conceptual
Framework
Animal
Welfare

'Internal document RDA'



COUNCIL ON
ANIMAL AFFAIRS

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Procedure

This Conceptual Framework of the Council on Animal Affairs (RDA) was prepared by a panel comprising ir. M. de Jong-Timmerman, prof.dr.ir. B. Kemp, dr. F.L.B. Meijboom, drs. R.A. Tombrock en dr. ing. H. Hopster (chairman).

The panel convened seven times. The resultant document has also been presented to and discussed with the Council in a separate plenary session. The panel was supported by the secretary of the RDA-team M.H.W. Schakenraad and deputy-secretary R.L. van Oudheusden MSc BA. This Conceptual Framework is an unsolicited initiative of the Council.

Structure of the document

This Conceptual Framework starts off with a general introduction on the reasons for preparing it and its subject matter. This introduction is followed by a section on background considerations and points of discussion concerning the key notions addressed, resulting in a provisional working definition of each of these key notions. Section 3 is a concise survey of the definitions that will henceforth be used by the Council: the Conceptual Framework Animal Welfare

1. Introduction

1.1. Motivation

The Council on Animal Affairs advises on multidisciplinary issues concerning animal welfare and animal health, either on request or of its own accord, taking into account both their societal aspects and pertinent scientific understanding.

Multifaceted notions such as animal welfare, intrinsic value and natural behaviour often come up in the Council's advisory reports. One aspect is their scientific meaning, which evolves with the accumulation of scientific insight through research. Another is their legal interpretation as expressed by law.

Notions like animal welfare and intrinsic value are mental constructs which serve to structure and clarify the social and political discourse on how to treat animals and what policies are desirable, and set its boundaries. Many such notions are susceptible to broad as well as narrow interpretations. Also, they are used in social contexts where personal convictions and individual frames of reference come into play. This often leads to confusion.

The Council attaches great importance to transparency and consistency in decision procedures in general. So of course it wishes to avoid confusion and lack of clarity in its own advisory practice by adhering to maximally transparent, unequivocal and consistent descriptions and definitions. By presenting the present conceptual framework the Council aims to clarify exactly how it interprets a number of common key notions and uses them in its advisory reports, in order to facilitate discussions within the Council as well as between the Council and its members and external parties.

1.2. Approach and scope

First and foremost the Conceptual Framework is intended as a guide to the consistent use of terminology in the advisory reports of the Council itself. But it may very well benefit others too. The Council does not intend to present new views on concepts and definitions, it just wishes to reformulate and summarize existing theoretical insights and frameworks as unequivocally as possible. It does not aim to dissect scientific concepts and ethical theories down to the last detail, but limits itself to their relevant practical implications. The Conceptual Framework is broad in scope, covering both livestock and wild animals. Due to the wealth of available research data, many examples will derive from the world of farm animals.

As a result, the Conceptual Framework will serve as a reference, specifying and clarifying the view of the Council on insights and frameworks. It is an instrument for mutual approximation within the Council and offers a framework for the Council to rely on in its operations. Other results and/or productions depend on internal discussions within the Council or the panel. The descriptions in the Conceptual Framework further specify some of the values pertaining to animals and related ethical considerations in the Council's own policy assessment framework *One Health* (RDA 2015b). The animal and acknowledging its intrinsic value are key here. As such, it helps to factor in the values and interests of the animal in a consistent way.

Relevant concepts

From previous reports a list was culled of definitions of key concepts relating to animals proper and our relations with them, regarding both livestock and animals in the wild, as they have been used by the RDA. These are:

- intrinsic value;
- animal welfare;
- natural behaviour;
- ability to adapt;
- integrity (and specific nature).

Approach

Each of the above concepts has its background described, is discussed and assessed, and defined accordingly. Scientific insights and social and moral aspects are both taken into consideration, as are contextual influences and the different levels of definition. The result is a state of the art operational definition which can be relied on when preparing new advisory reports. On each occasion their continued appropriateness and possible reasons for deviating from them will be assessed.

Correspondence between concepts

Given that animals as such are worthy of our protection, irrespective of their use to humans, acknowledging the intrinsic value of animals is the cornerstone of our thinking. Figure 1 illustrates the ensuing correspondences between the concepts under consideration.

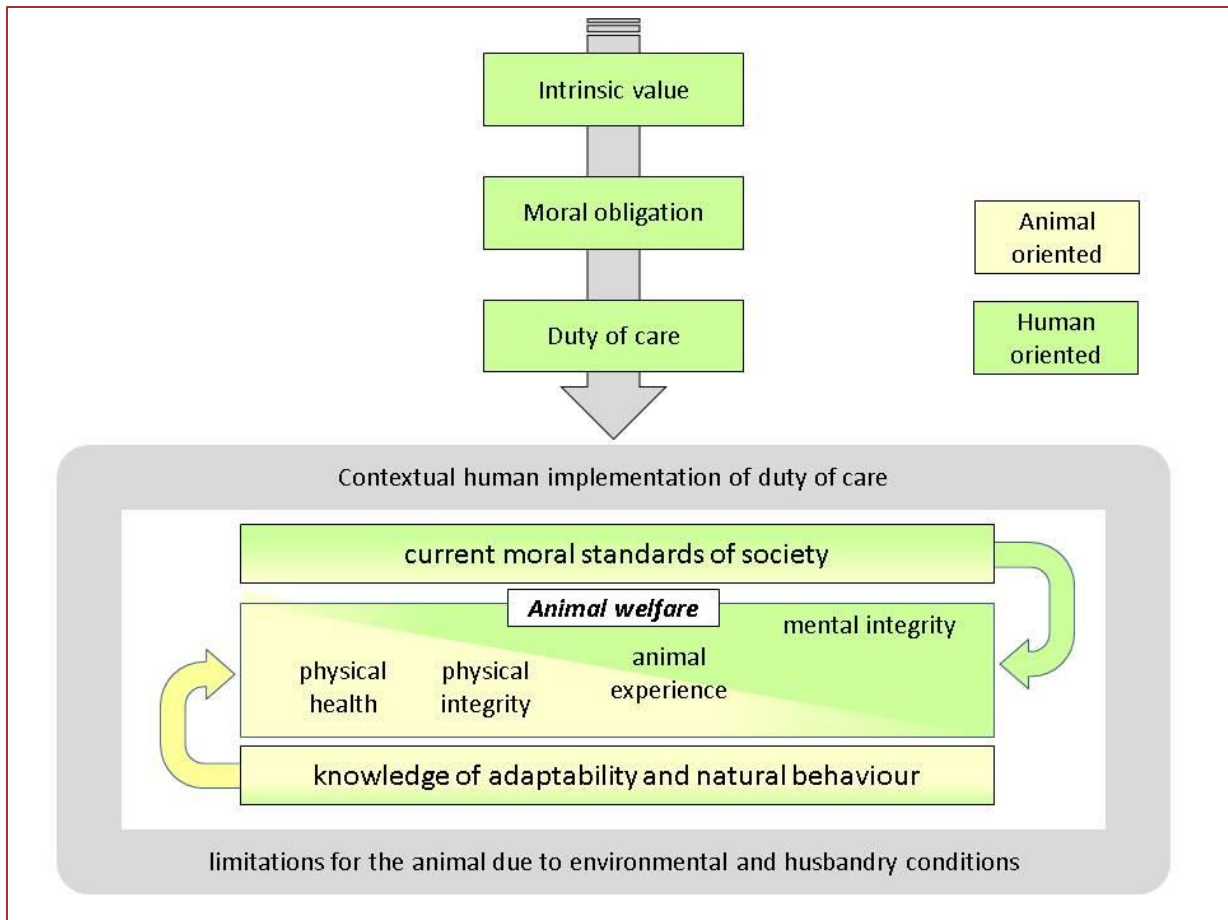


Figure 1: Correspondences between concepts under consideration

The human, ethical perspective is shown in green, the biological perspective of the animal in yellow. Recognizing the intrinsic value of the animal entails a moral obligation towards animals and their welfare, health and integrity. This moral obligation holds regardless of context, the ensuing duty of care, however, must be implemented according to circumstances. Welfare, physical health, physical and mental integrity, and respect for the specific nature of the animal each depend in part on the adaptive capabilities and natural behaviour of an animal or group of animals, as well as on ideas about relations between humans and animals which are subject to change — the moral standards in Figure 1. Eventually, the integral assessment of values and interests decides how our duty of care is to be implemented in a particular context, what limitations the animal will be subjected to and how these affect its physiology and behaviour. In this process, scientific knowledge, animal and human interests and relevant points of ethics must all be addressed.

2. Discussion of concepts

2.1. Levels of description

The more general the definition of a concept, the wider its range of application tends to be and the larger the fraction of the population that will be comfortable with it. By the same token it will lose precision and its applicability to specific cases will suffer.

The reverse holds as well. Stafleu et al. (1996) illustrate this. They show that different implementations of the idea of animal welfare have different meanings as well as different practical consequences. The more attention is devoted to biological parameters and measuring animal welfare, the greater the risk of losing sight of the general idea of animal welfare and concomitant moral issues.

According to the authors, political decision making too is negatively affected by the multitude of parameters that research results in. It engenders confusion and uncertainty as to which particular parameters are relevant and how they might be interpreted in terms of animal welfare. The larger the amount of research data grows, the more nuanced an issue becomes, and the greater the uncertainty and ambiguity. This may get in the way of the real issue at hand: deciding on how to treat animals properly. It is a problem for the political system to deal with, in its role of authoritative attributor of values.

The Council's fundamental stance is that animals have intrinsic value and do morally count (CRM 1981). As a consequence, the animal is key. That said, even though an animal's basic needs are the same under any circumstances — a rabbit, whether it is kept as a pet, a production animal or a laboratory animal, or lives in the wild, is always a rabbit — other values and interests than those of the animal may weigh in. These usually appertain to the reasons for keeping an animal, the conditions under which it is kept, and its status.¹ For example:

- the end to which an animal is kept (e.g. food production, company, entertainment, nature conservation, hobby or recreation, research);
- the status accorded to the individual animal or its species, depending on the personal tie with the owner;
- the amount of knowledge available about the animal or its species;
- the number of individuals of a species in existence;
- economical, ecological, egocentric, cultural and other values and interests.

This array of factors in its entirety ultimately determines to what extent the needs of animals will be met, how we implement our duty of care and which level of animal welfare we are inclined to guarantee in a particular context of use. That different target levels obtain with different contexts, does not necessarily point to inconsistent policies, it is simply the context dependent outcome of the integral assessment of values and interests.

The radar diagram of Figure 2 shows how two different contexts — rabbits in a production context (blue line) and as pets (red line) — shape the assessment of rabbit

¹ De Cock Buning, 2009.

welfare norms and what concessions with respect to their needs are made accordingly. Each corner represents a particular requirement of the species.² The green line along the edges represents the situation in which all the needs of the species are completely fulfilled. The deeper a line bends towards the centre, the more serious the requirement in question and the intrinsic value of the animal are compromised.³

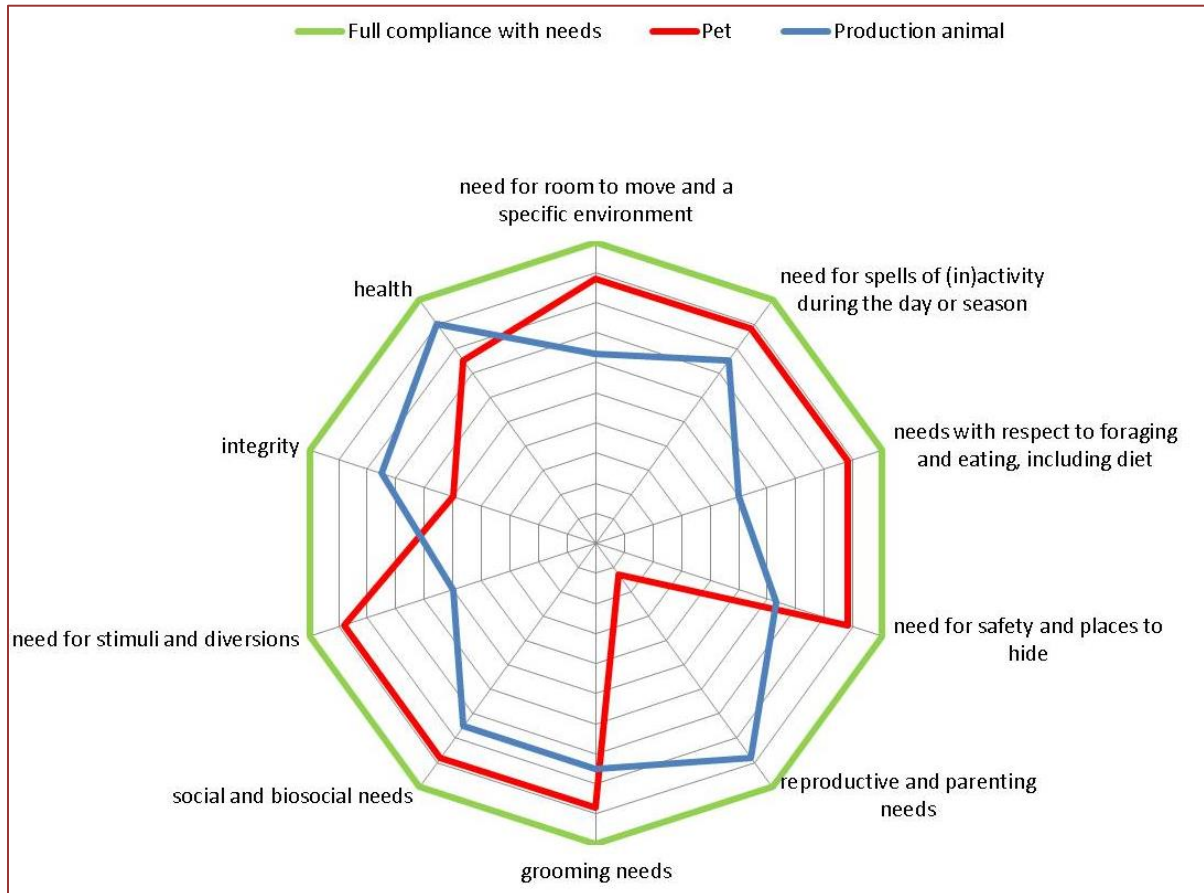


Figure 2: Impact of context of use on the welfare of an animal, its health and its integrity

In the following sections the concepts pertinent to this Conceptual Framework will be discussed in detail. Wherever feasible the 'biological' point of view with its focus on observation and scientific data and insights will be kept apart from social and ethical considerations. The latter are primarily concerned with determining which data count and assessing their importance and implications.

Biological and ethical aspects cannot be kept completely separate. Ethical appraisal is not a kind of afterthought, moral implications of research play a role right from the start. They enter into determining what should be investigated and which phenomena to observe, but also into the interpretation and assessment of findings. Empirical questions

² The requirements in Figure 2 have been taken from section 1.4 of the *Besluit houders van dieren*, which specifies criteria for placing animal species or groups of species on the list of species allowed to be kept for recreational purposes.

³ As the diagram shows, deviations from the ideal can be quite large. Rabbits kept as pets are preferably castrated, which does not only render them incapable of procreation but also compromises their integrity. Production rabbits do not suffer in this way, but are subject to restrictions with respect to foraging, stimuli and diversions. Apart from all this, professional rabbit owners go to great lengths to keep their animals in good health, whereas pet owners on average treat their animals rather more sloppily in this respect.

about defining, measuring and assessing aspects of animal welfare cannot be answered without moral reflection and normative assumptions (Bovenkerk & Meijboom, 2012).

2.2. Intrinsic value

Animals have intrinsic value, which means that we recognize their value irrespective of their usefulness to people.⁴ This intrinsic value was first mentioned in the Law on Experimenting on Animals (Wet op de dierproeven) of 1977 and the Law on Flora and Fauna (Flora- en faunawet) of 2002, and has been made part of the Animal Law (Wet dieren) of 2013. Furthermore, the concept of intrinsic value of nature is part of the Nature Conservation Law (Wet natuurbescherming) of 2017. In the ongoing ethical debate in society the question whether intrinsic value might also be accorded to populations or species crops up time and again. The concept of intrinsic value is thus associated with individuals as well as populations, species and nature as a whole. This broad application raises questions about the precise meaning of the term and its conceptual underpinnings.

Conceptual confusion

In principle, the term intrinsic value can be taken to refer to each of the following:⁵

- an animal's value apart from and unrelated to its commercial or productive value;
- an animal's value based on its intrinsic characteristics (e.g. rationality);
- an animal's objective value, the value of an entity of its own accord.

Clearly, discussions may well bog down in uncertainty of a conceptual (what exactly are we talking about?) or normative (what ought we to do?) kind. Disputes arising from the idea that we have an obligation toward animals based on offense to others are a case in point. If the particular way citizens treat or use animals gives rise to feelings of disgust, shame or disillusionment, restricting their freedom to do so may be justifiable. But mind that we're treading on treacherous ground here, for it is not at all clear that actions which offend people or are seen as disgusting are always undesirable, let alone that they ought to be forbidden. A minimal requirement for prohibition would be that some existing right is being infringed upon and that offense is widely taken, as is the case with actions that are considered demeaning and inhumane. From this point of view, one reason why abusing or neglecting animals is undesirable is its effect on morals, because it does not square with received standards of common decency. Such ideas underlay the first movements that championed the protection of animals and ensuing laws (RDA, 2015a).

One possible way of interpreting the notion of intrinsic value is by means of the telos-approach (see also 2.6). Struik et al. (2016) take intrinsic value to mean 'the value an animal has because of its sheer existence; because it is a unique form of specialized life; because it is autonomous and as such deserves to live; because it has a part of its own to play within its own niche within an ecosystem (often in a husbandry setting), a part which contributes to the diversity of life on Planet Earth and to the homeostasis of System Earth and because evolutionarily it went before us, preparing the ground for our human way of life.' This biocentric approach puts the ecosystem first and considers man as a partner of nature (Taylor, 1986). It contrasts with the anthropocentric approach,

⁴ RDA, 2012, reiterating CRM (1981), Nota Rijksoverheid en Dierenbescherming, Ministerie van Cultuur, Recreatie en Maatschappelijk werk, Tweede Kamer II, 16 996, nr. 2, p. 4.

⁵ Musschenga, 1994.

which centres on mankind and assesses everything in relation to and in terms of usefulness to mankind. Some anthropocentric values are the socio-economic importance of animal husbandry in terms of work, income and export, and killing male day-old chicks using CO₂ on account of the disgust caused by feeding them to a shredder. Between these extremes all manner of positions are possible.⁶ Using four principles that are also fundamental to medical care, Figure 3 shows how any point of departure has its own practical implications regarding our obligations towards animals. This diversity is politically relevant. In a pluralistic democracy like ours, policies must do justice by a multitude of positions. Positions which are not static, not even as a group. The grey arrow in Figure 3 represents the general trend that seems to exist towards more biocentric views.

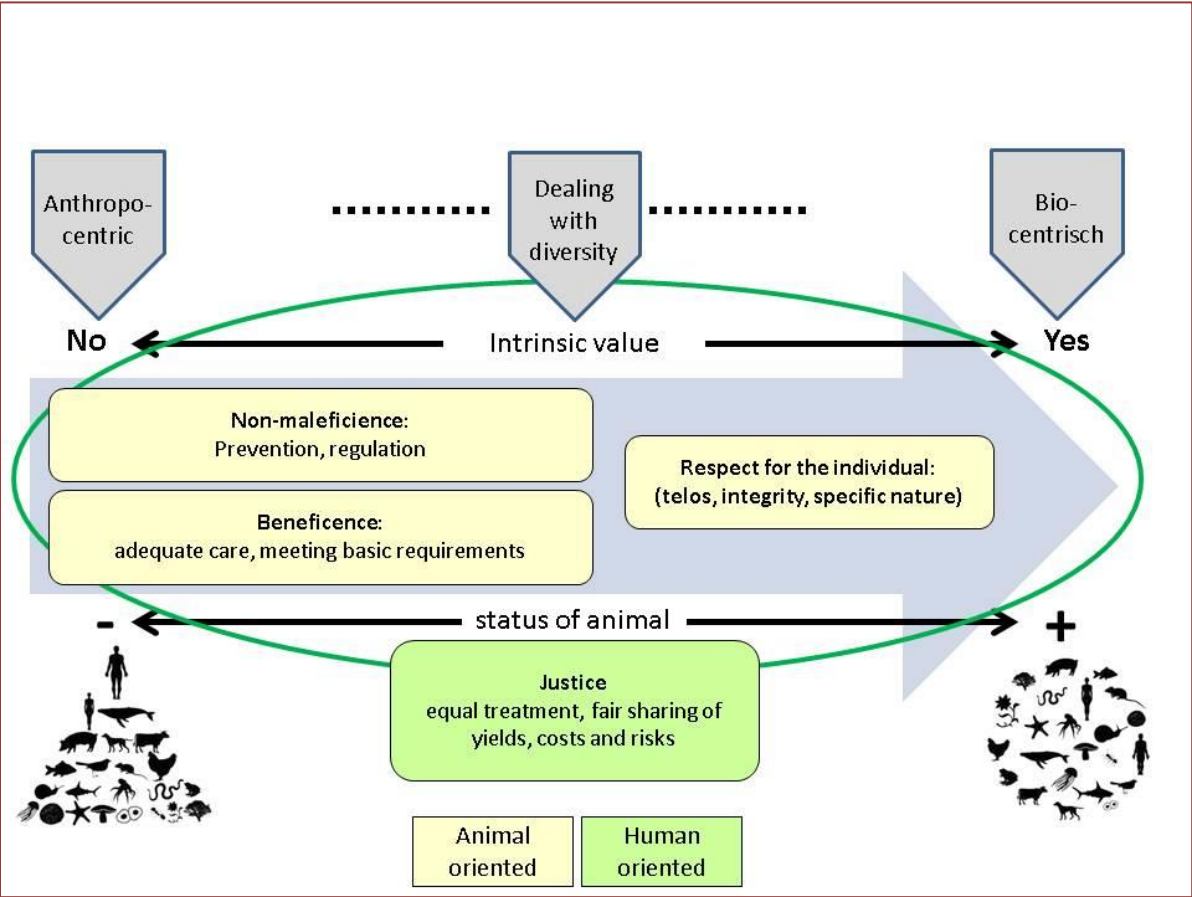


Figure 3: How to flesh out the concept of intrinsic value according to one’s position on the axis from anthropocentric to biocentric

Legal recognition of intrinsic value

In the Treaty of Amsterdam of 1997, the European Union laid down that welfare is an important factor in dealing with ‘sentient beings’, animals that feel. This was reconfirmed in the Treaty of Lisbon in 2009.⁷ Recognising that sentient beings have interests of their own which can be compromised is a prerequisite for any widely supported but not exclusive rationale behind intrinsic value. As the RDA put it, ‘The fundamental recognition

⁶ Beauchamp, T.L. and Childress, J.F., 2001. *Principles of Biomedical Ethics*. Oxford University Press, New York.
⁷ Treaty of Lisbon, Article 13: In formulating and implementing the Union's agriculture, fisheries, transport, internal market, research and technological development and space policies, the Union and the Member States shall, since animals are sentient beings, pay full regard to the welfare requirements of animals, while respecting the legislative or administrative provisions and customs of the Member States relating in particular to religious rites, cultural traditions and regional heritage.’

of an animal's intrinsic value and of its status as a sentient being holds of all animals, domesticated or in the wild' (RDA 2012). It added that the same holds of the ensuing moral obligation to consider the animals' welfare in dealing with them. The question which animals count as sentient and which do not will be addressed in the section on animal welfare.

Because intrinsic value can be understood in so many different way, the Animal Law does not specify the concept any further than 'the particular value of animals as sentient beings', although it is clear that the Five Freedoms are considered part of it.⁸ However, mentioning intrinsic value and a duty of care that goes beyond mere animal welfare is a clear normative choice. The recognition of intrinsic value is a moral point of departure: animals have value of their own accord, irrespective of what they mean to people. As it stands, however, merely referring to intrinsic value does not sufficiently determine what is morally right or desirable with respect to our dealings with animals.⁹ Although the emphasis is on the prevention of harm to animals, a duty of care is mentioned Article 1.4 of the law but not operationalized.

Consequences of the recognition of intrinsic value

Respecting the animal's intrinsic value entails a constant awareness of the fact that how we treat animals has consequences for the animal, for which we are morally responsible. The utility and necessity of what we do to or with it must be established at all times, and our duty of care must be fulfilled. This does not mean that animals cannot be used for human goals, but it does imply that in our dealings with animals the leading principle must be 'no-unless'. The primary question is whether what we intend to do is in the interest of the animal too. If not, a justification for our actions is in order.

Since animals, domestic animals in particular, depend on us, respecting their intrinsic value entails a duty of care for those in charge of an animal or group of animals. The way in which it is satisfied depends on technical, practical and ethical assessments. The outcome of this process need not always be a course of action. We might also decide not to act, in order to let animals lead a natural life or prevent damaging them in the long run. In such cases, 'keeping off' is a way of satisfying our care of duty, not a lack of fulfilling it.

Care can be active and specific, centring on the individual animal, or passive and general, focussing on the habitat of a population. According to Swart and Keulartz (2005, 2011), the degree to which mankind affects an animal's physical surroundings determines what is desirable: the stronger man's influence, the more specific the care that is called for (RDA, 2012).

The duty of care for domestic animals is laid down in the Animal Law (Wet dieren) of 2013 and for animals in the wild and their habitats in the Law on Conservation of Nature (Wet natuurbescherming) of 2017.

⁸ For further explanation see the explanatory memorandum of the Wet dieren.

⁹ Explanatory memorandum Wet dieren.

Intrinsic value defined

Recognizing the intrinsic value of animals and their status as sentient beings entails a moral responsibility to take welfare into account when dealing with animals.¹⁰ Animals and their interests must be part of all considerations.¹¹ However, the animal interest is always represented by people, who often propose different arguments grounded in different basic attitudes and using different frames of reference. Acknowledging the existence of many different views on the concept, the RDA defines intrinsic value as follows:

The term intrinsic value refers to the value inherent in an animal, irrespective of its utility. Respecting this inherent value means factoring in the interests of animals in all decisions that affect them. Specifically, there is a moral obligation for human intervention not to cause structural or serious damage to the welfare, health or integrity of animals or their habitat.

2.3. Animal Welfare

Animal welfare is a multi-layered concept interpreted in many different ways on different levels of abstraction, which causes confusion. 'Like health, environment or security, the concept of animal welfare can be defined at different levels' (Stafleu et al., 1996) 'It did not originate as a scientific notion, but as a reflection of a value system expressing worries about the way animals are treated' (Duncan and Fraser, 1997). The concept helps to operationalize those worries, structure the debate and keep it on track. The idea of animal welfare unifies scientific research, i.e. the measurement of animals and their habitats, and interpretations of data with respect to social values and standards in a natural way.¹²

Motivated by compassion and an urge to prevent as much unnecessary suffering as possible from occurring, parties often define animal welfare in negative terms, as the absence of discomfort or impaired welfare. This is how, on the basis of earlier proposals by the Brambell committee in 1965, the British Farm Animal Welfare Council (FAWC) came to formulate the Five Freedoms that would guarantee the best possible standards of welfare in all husbandry contexts. Animals should be:

- free from hunger, thirst and malnutrition;
- free from thermal and physical discomfort;
- free from pain, injury or disease;
- free from fear and chronic distress;
- free to go through normal, appropriate patterns of behaviour.¹³

The first four of these five freedoms reflect the idea that welfare equals the absence of 'un-welfare'. 'This is also the position taken by the Dutch government: In its report *Dierenwelzijn* (Animal Welfare) of October 2007 it qualified the Five Freedoms as "parameters of proper animal well-being". Positive aspects of being well do not enter into these and similar definitions of the first four freedoms.' (RDA, 2009) The fifth freedom,

¹⁰ Some philosophers of consciousness consider 'sentience' as the capability to subjectively experience sensory and emotional signals.

¹¹ In this respect the assessment framework compiled by the RDA some time ago may be of assistance.

¹² From Hopster et al., 2009. Also in RDA, 2009.

¹³ The FAWC focusses on the animal's behavioural needs in its communications as well (FAWC, 1979). In the section 'Natural Behaviour' we will discuss how this translates into normal or natural behaviour.

alternatively defined as 'being free to express natural (species-specific) behaviour', does allow for the inclusion of positive factors.

In Europe, the Five Freedoms function as guidelines for posing questions about a feasible ideal level of welfare, primarily a moral concept structuring the debate. Due to new scientific insights, the focus of attention has shifted towards the perception of well-being and positive aspects of welfare, such as pleasure, contentment, affection and euphoria.¹⁴ A concrete example is the European Welfare Quality approach.¹⁵

Even in the absence of consensus about the essence of the concept of animal welfare and its ethical framework, Hagen et al. (2011) claim, approaches like Welfare Quality show that a kind of 'mainstream consensus' exists on how to operationalize concepts of welfare within both science and policy making: there are fundamental ideas about what is important to an animal. The Welfare Quality approach is in fact an operationalization of the ideas that motivated the Five Freedoms in terms of a set of specific criteria, applicable in real situations and stressing the importance of focussing on the animal.

Finally, let's not forget that better standards of animal welfare, including health, may benefit humans as well through increased production or improved quality of animal products. Also, husbandry offers certain advantages to animals as well, such as protection from predators, shelter, health care and a guaranteed supply of food and water.

Scientific dimension

The level of welfare of animals is determined by biological facts like their physical and mental health. It is therefore important that these facts are assessed on the basis of scientifically sound knowledge and validated measurements of, for example, what they eat, how they reproduce and what other behaviours they express. Preferably, the measurements are taken from the individuals concerned. Assessing the subjective experience of the animal, i.e. its mental health, is not easily compatible with the need for aloof objectivity, which stresses the importance of intersubjectivity and scientific validation.¹⁶

Assessment of the level of welfare is unrelated to the end to which an animal must serve. The criteria used in the case of farm pigs are identical to those used with pigs as pets, in zoos or in the laboratory.¹⁷ However, the principle of risk based monitoring allows for small context dependent differences. In the case of rabbits raised for meat in wire cages, foot lesions merit special attention. With rabbits kept as pets it makes more sense to focus on spatial needs and the presence of conspecific company.

¹⁴ Boissy et al., 2007.

¹⁵ See www.welfarequality.net. Motivated from both science and society, the intention was to improve the welfare of animals by means of monitoring them using species-specific practical tests and measuring points, and in this way to integrate animal welfare in chain quality care systems. The project resulted in a set of practical tools and furthered consensus in a number of respects. Next to parameters for physical health, vitality and integrity, indicators were identified of aspects of behaviour, i.e. mental health (RDA, 2016). However, validation and quantification of aspects of behaviour remain difficult. It is not always clear why an animal shows certain behaviours. Digging may result from an urge to hide (consummatory behaviour) but may also occur for its own sake (appetitive behaviour).

¹⁶ Intersubjectivity is the degree to which members (subjects) of a (professional) community share views on some issue.

¹⁷ Adapted from RDA, 2009.

As a result of growing insight more attention is devoted to managing adaptive processes and their perceptual and emotive impact. Behavioural needs and individual behavioural and physiological differences in coping have also gained prominence.¹⁸ Today, animal welfare is usually understood to be a condition internal to and experienced by the animal.¹⁹ As Bracke et al. (1999) put it: 'Animal welfare is the quality of life as experienced by the animal itself.' This condition of well-being is the end-product of the characteristics of the individual and the circumstances it is exposed to.²⁰

Assessing the mental or physical experience of another invokes philosophical dilemma's. What can one say with certainty about what another person or an animal thinks, feels or experiences? On the surface, emotional states can present themselves in very different ways in different individuals. That said, some evident emotions leave little room for doubt, in people as well as in animals.

Ultimately it is us, humans, who determine whether an animal's welfare is or is not compromised by experiences we ascribe to it. We steer by observation of the animal itself, noting which behaviours it shows or doesn't show and gauging certain physiological parameters. But what exactly do we need to know about animals in order to be able to say something useful about their welfare? Which facts count and how should we interpret them?

Behaviour, physiology and taking measurements

Provided we have sufficient knowledge of the behavioural repertoire of a species and the level of variety in expression between individuals of that species, behaviour betrays a lot about an animal's welfare. Even so, caution is advised. Impaired well-being does not always out as recognizable behaviour, and behaviour can be misinterpreted. Prey species, for example, naturally tend to repress signs of weakness and pain to avoid attracting the attention of predators. There are also differences between the normal adaptive behaviours animals show to compensate for changes in their circumstances, such as shock, aggression, fleeing or hiding on the one hand, and, on the other, aberrant, maladaptive responses like stereotypic or (self) damaging behaviour, and apathy. Welfare is also affected by behavioural restrictions caused by husbandry conditions.²¹ It is generally risky to pronounce upon the welfare of both livestock and animals in the wild on the basis of one or a few behavioural parameters.

Other quantifiable physiological indicators inform us about the level of well-being of animals as well, such as levels of cortisol and biomarkers of organ function, brain activity and metabolism. Due to their complexity and interdependencies, they are not always readily interpretable. Normal levels are dynamic, which makes deviations difficult to judge. As in the case of behaviour, there are differences between species as well as between individuals of a single species.

¹⁸ Examples are research on the requirements for water in minks (Schwartzter et al., 2016), on coping strategies (e.g. Koolhaas & Van Reenen, 2016), and affective neuroscientific research (e.g. Panksepp, 2015).

¹⁹ Fraser, 2008; Broom, 1986.

²⁰ Welfare is not an immutable condition, an animal may experience different levels of welfare. A positive state of well-being will result in the animal attempting to keep things as they are. Animals may even apply themselves to improving an already satisfactory level of welfare. Keeping things as they are may however lead to boredom, and so deteriorate the level of welfare. Animals experiencing a negative state of well-being will try to change their situation, unless things have come to a point where they have become apathic and suffer a condition of learned helplessness.

²¹ Adapted from RDA, 2009 and RDA, 2016.

Some quantifiable indicators of animal welfare are the following:

- positive (social) behaviour like playing, grooming and other care, explorative behaviour and foraging, feeding and resting together;
- aberrant behaviour like stereotypic behaviour, excessive aggression, apathy and (self) damaging behaviour;
- mental condition as indicated by posture, emotions and cognitive bias;²²
- physical damage: illnesses and lesions like ulcers, pulmonary trouble, foot and tail lesions, lameness and premature death;
- physiological indicators, primarily relative differences in hormone levels and dynamic of measurements.

Stress and pain need not always be negative. They can, for example, function as a biological incentive to take care of oneself, find a place to hide and rest or adapt to some change in the environment. But neither should occur too often or become chronic. How much an animal in a given situation can 'take' is determined in part by its level of stress combined with the amount of external pressure exerted on it. Bad husbandry conditions may overtax an animal (allostatic load) and harm its ability to adapt. Pigs are a case in point, which show more maladaptive behaviour and are less resistant to disease if they are insufficiently able to scavenge and forage.²³ Offering a completely stress-free existence, on the other hand, is neither feasible nor desirable.

Comparing Species

Generally, measurements of animal emotions are interpreted by comparing them to what people experience. This is justified by the homology postulate, the idea that animal possessing relevant brain structures and processes similar to those of humans and deriving from a common ancestor, might be subject to somewhat similar sensations and emotions. Granted considerable variation between species, this idea is to some extent supported by the presence of the limbic system, an evolutionarily old component of the brain common to all mammals and mainly involved in processing sensations and emotions. In the course of evolution, species may also independently develop functionally similar characteristics and properties and so come to share them.²⁴

Determining whether animals with simple brains lacking the limbic structures are capable of experiencing sensations and emotions is extremely difficult. Even more elusive is the answer to the question which animal species are sufficiently 'sentient' to experience discomfort, pain and stress consciously and are therefore capable of suffering. The empirical evidence available is equivocal. We are dealing with a highly complex interaction between neurological processes, further complicated by differences in ways of life, design, physiology and (neuro)anatomy, behaviour and ecology. Small wonder that there are many different takes on the experience of a given species.²⁵ Distinctions between pain, stress, fear and learned behaviour are often far from clear. In addition,

²² Cognitive bias refers to the idea that neutral choices are influenced by one's mental condition. Consider, for instance, animals trained to expect a reward when a red signal flashes, but not if the signal is yellow. Supposedly, upon showing such animals an orange signal, individuals with a positive disposition tend to interpret it as red and negatively disposed individuals most likely see it as yellow.

²³ Dixhoorn et al., 2016.

²⁴ Properties that have developed from structures in a common ancestor are called homologous, properties that have evolved independently in more than one species are analogous. Thus, the human hand is homologous to a bat's wing, which in turn is analogous to the wings of insects. The brains of all vertebrates are homologous. The process causing analogy is called convergent evolution (de Waal, 2016).

²⁵ See for example Crook and Walters, 2011.

members of the same species may differ among themselves with respect to coping with pain and signalling it.

Meanwhile generalisation runs rife, most strikingly in the common comparison of mankind, a single species, to 'the animal', millions of species. The basic distinction between vertebrates and invertebrates is often seized as an opportunity to deny the invertebrates the powers of consciousness and sensing pain. Fish number more than 25,000 biologically extremely diverse species, yet they are often lumped together as one undifferentiated amalgam. Only a few species of fish have been looked at by researchers, while research data cannot be extrapolated to other species just like that. These kinds of reservations routinely get lost in the animal welfare debate.

The situation is further complicated by a lack of consensus about whether it has been sufficiently established in all species to what extent pain and suffering are conscious experiences. What exactly fish and other species feel, and how, cannot be established beyond doubt. Strictly speaking this is true even for people. More than anything else, we need an intersubjective judgment on the validity of observations.

Assessing the welfare of insects and other invertebrates on the basis of observations is even more difficult. Their reactions are largely unfathomable, precluding any conclusions about the existence of distress and pain in them. Although Crook and Walters (2011) claim on the grounds of evolutionary divergence and distinctly different life styles, physiology and neuroanatomy that the mollusc experience of pain is essentially different from the experience of mammals, the question what that means for their capacity for suffering remains unanswered.

Social and ethical dimensions

The concept of animal welfare is not merely biological in nature. There are clearly normative ramifications, including issues like what should be deemed acceptable when dealing with animals and how, from our point of view, animals should live their lives. Answers to such questions result from a moral framework, based, in the case of the Netherlands, on recognition of the intrinsic value of animals.²⁶ From this recognition follows a duty of care, a moral obligation to take the welfare of animals into consideration.

This social and ethical dimension of animal welfare plays a role in several ways. For one thing, it enters into the process of defining what animal welfare is, how the notion can be operationalized and how welfare can be measured. The debate on the extent to which a given species can experience well-being has immediate consequences for the answer to the question what obligations we have towards it, because welfare deficiencies harm the animal's interests. Different definitions of animal welfare themselves derive in part from normative debates on the moral value of animals, the moral relevance of cognitive and other capabilities, and the importance of animal welfare as such. Finally, novel normative

²⁶ 'By "standards of welfare" the Council means social standards of animal welfare. These are rooted in public morale, the set of accepted moral standards of society. They depend upon scientific evidence on levels of animal welfare only inasmuch as a demand for "a high level of animal welfare" can only be meaningful if it can reliably be established scientifically what a "high level of welfare" actually consists of. As a consequence, welfare norms are dynamic and may change over time. Eventually, norms are the outcome of the assessment of relevant interests and may vary between different contexts of use, even for a single species. For example, in weighing the health of animals against that of the people involved with them, greater weight will be accorded to the latter, while at the same time the animal's welfare interest may outweigh people's rights of ownership.' (RDA, 2009)

issues keep cropping up in the dialogue between philosophy and animal welfare, such as naturalness, integrity, dignity, death and mental phenomena.²⁷ First and foremost, these novel elements show that not all relevant moral questions can be captured by the notion of animal welfare, but they also point to the permanently dynamic character of the debate in view of ongoing scientific and normative developments.

Second, there is the precautionary principle. As long as research provides indications that animals do experience and deal with pain, but not conclusive proof, the precautionary principle calls for prudence in creating circumstances which may cause them discomfort or pain. Since we cannot prove either that animals do not suffer pain, we must act cautiously on the basis of informed ignorance.

Thirdly and lastly, moral considerations apply when animal welfare clashes with other values, such as public health, economics, the quality of the environment or the welfare of other animals. With respect to the welfare of groups and populations the Council has stated previously that 'a group of animals must be free to adapt to current circumstances, which means that the degree of freedom enjoyed by each individual animal counts as a functional part of the total. Individual differences may actually contribute to the adaptive capabilities and self-sufficiency of the group as a whole. Therefore, interventions with respect to one individual animal may have negative effects on other members of the group, either immediately or in the long run. This is why paying attention to the group or population which it is part of as an important factor of its habitat, is part of our care of duty with respect to an animal.' (RDA, 2012)²⁸ Because interventions on behalf of one individual may have negative consequences for the population as a whole, say by disturbing its fitness markers, a moral assessment is required. This is also the case when improving welfare puts extra pressure on the environment, since the wider implications surpass the mere welfare of the animals in question.

The limits of Animal Welfare

The debate about our dealings with animals is about more than just animal welfare, although the concept is often incorrectly used to make a point about other, independent moral issues like an animal's lifespan, structurally killing off superfluous young animals as a feature of husbandry systems, the acceptable number of animals per establishment, the naturalness of habitats and the integrity and specific nature of an animal. It happens, for example, that animals are killed off under the pretext of preventing further suffering, while the underlying social problem does not necessarily have to do with animal welfare.

In addition to animal welfare, the broader concept '*Quality of life*' is part of the ethics of our relationship to animals: what is the quality of the life an animal leads and what constitutes a dignified life? It remains unclear how animal welfare and quality of life are related, nor do we know how impairments of an animal's welfare affect the dignity and quality of its life.

It is the Council's intention to maintain a strict boundary between matters pertaining to animal welfare and other issues in all its advisory reports.

²⁷ See Hagen et al., 2011. Next to absence of suffering, Haynes (2011) mentions as morally relevant 'the possession of desire, which includes not just needs but wants and wishes: intentions, purposes, or goals; the ability to reason; and self-awareness.'

²⁸ The definition developed in this Conceptual Framework is geared to the individual animal.

Animal welfare defined

Roughly half a century has not been enough to bring the debate on the meaning of the notion animal welfare to a close. The conceptual framework of the Five Freedoms remains prominent, but is often taken too literally. It is, for example, used in drawing up minimal requirements for husbandry conditions, for which it was never intended. The Council is convinced that a satisfactory definition of animal welfare must be grounded in results of scientific research and the outcomes of the discussion on ethics in society, and must minimally address the following three issues:²⁹

- health, in terms of functional criteria like growth, reproduction, physical condition and ability to adapt (influenced by e.g. predictability and control);
- emotional status, in terms of affective criteria like sensations of pain, fear and discomfort, and also positive emotions;
- naturalness, behaviour specific to the species (see section 2.4).

Working definitions of animal welfare may vary with context, also between advisory reports of the RDA, provided the above elements are part of them. Taking the perspective of the animal, for now the Council will adopt the following definition:

“Animal welfare is the quality of life experienced by the animal.” (Bracke et al., 1999) An animal experiences a positive state of being if it is free to perform normal patterns of behaviour specific to its species and can respond adequately to the challenges posed by its environment.³⁰

2.4. Natural behaviour

In many countries the concept of natural behaviour does not enter into definitions of animal welfare. In the Netherlands, however, the phrase ‘normal patterns of behaviour’ of the fifth Brambell-freedom has been interpreted as ‘natural behaviour’.³¹ This has added prominence to the fifth freedom and has shifted the focus of attention towards the behavioural needs of animals.

At the same time, ‘natural behaviour’ is indiscriminately used to refer either to species specific behaviour of individuals or behaviours in keeping with the character of an individual. As a consequence, the Dutch interpretation causes confusion, the more so because natural behaviour is understood by some to be static, while indications keep piling up that behaviour is in fact highly dynamic and that animals can adapt their behaviour somewhat to meaningful changes in their circumstances.

Scientific dimension

In order to be able to assess animals and their welfare, one must know how animals function and behave under natural conditions, and how they go about coping with change. One can either take an ultimate view, focussing on the evolutionary

²⁹ Fraser (2008) specifically stresses the potential contribution of a proper balance between these three elements to ‘a system in which an animal functions well, in which positive feelings outweigh the negative, and in which it can express its natural behaviour in an effective manner.’

³⁰ These are challenges like hunger, thirst and inadequate nutrition; thermal and physical discomfort; lesions and afflictions; fear and chronic stressors.

³¹ In the days of the Brambell committee, ‘normal patterns of behaviour’ had a pretty specific interpretation. These days they are usually called ‘normal behaviours’.

developments which in time shaped current patterns of behaviour, or a proximate view, centring on the immediate causes of behaviour and the mechanism underlying it. (Tinbergen, 1963)

Natural behaviour is the behaviour that is characteristic of members of a species. 'The natural behaviour of animals in the wild results from an evolutionary process of selection, which lets those species survive, and within a species those variants, whose members are best adapted to their environment in the sense that they produce the largest number of fertile offspring. As a consequence, the behaviour of wild animals is tightly linked to the possibilities and limitations of their natural habitat.'³² This does not mean, however, that animal behaviour is static or that animals are unable to adapt their behaviour to changing conditions.

Domestication of animals, giving rise to the emergence of subspecies and races, has made it less obvious to accept the wild ancestor as a reference in every respect. It has been shown that the behavioural repertoire of the wild ancestor remains latently present in domesticated descendants and will quickly reassert itself once an animal is placed in a semi-natural environment (RDA 2009). Determining what a 'natural environment' is, can be problematic as well, because the corresponding wild type need not be the reference. In addition, the natural needs of an animal may have changed considerable through consistent breeding. And, last but not least, not all behaviours characteristic of an animal in nature will out equally strongly once certain important needs like food, water and shelter are being taken care of. One must keep in mind, however, that behavioural differences between wild and domesticated species are only rarely qualitative. Most often they are quantitative in nature (Price, 1984).

Animals show particular behaviours for all sorts of reasons. They may scavenge for material to build a nest or food to eat. In such cases the behaviour is not merely consummatory, i.e. motivated by having a nest or ingesting the food. It is also appetitively motivated, by the very urge to build or to forage. Furthermore, one and the same stimulus may trigger very different responses. A cornered animal may equally well want and try to flee as to hide.

Preventing an animal from carrying out behaviours it is motivated to perform may give rise to maladaptive conduct such as stereotypical behaviour.³³ This kind of behavioural pathology is a first indication that the animal is being subjected to such severe restrictions that its welfare and health are at risk. Conversely, the absence of abnormal behaviour is taken by some as proof of normality. But this is all too easy. An important part of the specific behavioural repertoire of any species consists of positive behaviours. These can be individual or social, or collective behaviours of a group or population.

Measuring and observing behavioural needs is not an easy task, regardless whether it concerns a single individual or social activities, like exploring and foraging together.

Social and ethical Dimensions

The behaviour of species may change through natural selection, domestication and human intervention, such as breeding. In some cases, undesirable natural behavioural

³² From RDA, 2016 and RDA, 2009.

³³ Stereotypical behaviours often betray their underlying cause. This is called channeling.

traits can be 'bred out', such as fear of humans or aggression. A prime example is the eradication of broodiness in laying hens by selection for egg-production. But what about the desirability of such practices? How do they affect the animal, does it experience any discomfort? Should we worry about loss of traits? What is morally acceptable and what not?

If we put the animal and its needs and behaviours first, there are consequences for how farms should be designed and run. Meanwhile current husbandry systems affect the characteristics of livestock, by breeding for example. The intricate interplay between such factors makes it hard for us to establish which needs and behaviours are essential to the animal, and which are not. And how much time and space is required by the animal to satisfy its natural behavioural needs? The scientific justification of existing norms leaves something to be desired, but quite apart from this it must be established what we consider to be acceptable and how generous we are prepared to be towards the animal.

Yet another factor is our perception of what behaviour 'ought to be like'. Pigs that spend whole days lying down do not behave as they would in nature. However, opinions differ widely as to whether a pig should be required to perform certain behaviours. A related matter is the question whether achieving natural behaviour is a goal in itself, or whether the needs of the animal or its group should take precedence.

And then there is the matter of self-development and self-expression, and which natural behaviours are important in this respect. Present day farming systems do not always allow animals to express their natural behavioural repertoire in full — reproduction, caring for offspring and social behaviours are cases in point. Once more: what do we find acceptable, and what not?

As long as we remain insufficiently cognisant of what constitutes an animal's natural behaviour, we cannot establish with any certainty when natural behavioural needs are compromised or what should count as a bonus. Opportunities for play might be viewed as the latter, as unessential extra's. But from the perspective of facilitating the development of social behaviour among members of a species, it counts as an essential requirement. At the very least, however, restrictions with respect to behaviour must not give rise to abnormal behaviour or cause persistent stress or damage to the animal. That said, optimal animal welfare is the Council's reference point.

Natural behaviour defined

Definitions of natural behaviour may vary with context, the advisory reports of the Council not excepted. At this point, the RDA defines natural behaviour as follows:

Natural behaviour is the behaviour which members of a species perform under (semi-)natural conditions, because it furthers their biological functioning.

2.5. Ability to adapt

By ability to adapt, adaptability or resilience we mean the set of innate as well as acquired skills which allow an animal to respond adequately to changes in its environment, without unduly serious or protracted negative effects on its functioning.

The ability to adapt is not static. It depends on the internal condition of the animal and its changing environment.

Groups or populations as such also have the ability to cope with new circumstances, say a changing supply of food or water. They do so as a result of the interplay of the adaptive efforts of its members. Within the group, individual members may deploy different strategies. Threats can be countered collectively. As with individuals, the ability to adapt of groups is not static. It depends on the interaction between its members and changes in the environment.

Scientific dimension

The reason for the existence of the ability to adapt is to maintain homeostasis, the tendency towards internal balance of the organism, in a changing world. It is rooted in physiological systems like the immune system and the regulation of body temperature, and behavioural strategies. All these systems have a genetic core, but are further honed during life under pressure from the environment. Just like behaviour, the ability to adapt is the product of a combination of both innate and acquired characteristics.

The genetic blueprint of an animal is its DNA-sequence. This blueprint changes over generations by natural selection, and also by domestication and by breeding: the selective activities of humans that go with domestication. Next to these genetic pressures, there are ontogenetic factors, everything which further shapes an animal during life but does not transfer to its offspring. Experience and learned behaviour are cases in point, but also the acquired immunity to communicable diseases. Somewhere in between are epigenetic adaptations. These are genetic changes that do not alter the DNA-sequence per se, but do affect following generations by switching certain genes on and off.³⁴

Effects of adaptation can be observed in both individuals and the group as a whole. King penguins, for example, battle extreme cold by huddling: they press in upon each other in such a way that they all take turns in shielding the group at its outside. Adaptive effects are also apparent in the activity of physiological systems. An animal which has contracted a virus will start producing antibodies. Figure 4 shows that adaptation occurs on genetic, epigenetic and ontological scales.

³⁴ Not every change in the expression of genes carries over to the next generation. See the bottom right corner of Figure 4.

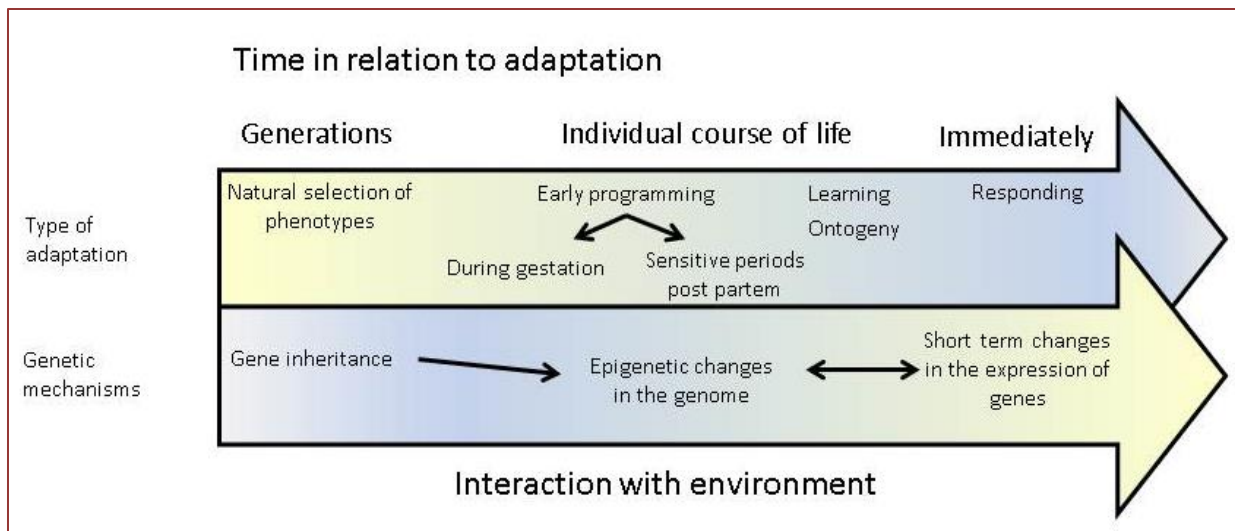


Figure 4: Time scales and mechanisms governing adaptations to the environment (After Beery & Francis, 2011)

If adaptive capabilities are overtaxed, as may happen when unfavourable husbandry conditions prevent an animal from performing certain important behaviours, abnormal behaviour may arise. Once it appears, such behaviour is often very persistent. Overtaxing is also detrimental to welfare and productivity. There are indications of interdependencies between welfare and health. Dixhoorn et al. (2016) show that pigs kept in bare surroundings where they are unable to satisfy their intrinsic need for scavenging and foraging not only show more abnormal behaviour like biting ears or tails, but are also much more prone to damage in so-called pathogenic challenge experiments. Their resistance to pathogens seems impaired.

Social and ethical dimensions

How far can we go in expecting animals to adapt and what limitations are there?³⁵ Conversely, how far must we go in providing conditions to which the animal does not have to adapt? From the point of view of the animal's welfare and integrity, we ought in principle not to force it to adapt at all. However, looking at things from other perspectives might lead to different conclusions.

As far as livestock is concerned, already domesticated and adapted to certain facilities and conditions, the discussion in this document centres on housing. When discussing animals in the wild, other factors are prominent. An obvious example is the debate on supplementary feeding during winter. Another is if, when and how people should intervene if an environment is becoming too demanding for individuals or groups to be able to cope. What if intervention to save one individual reflects negatively on the resilience of others, on the group as a whole or on future populations (RDA 2012)?

³⁵ The issue here is what adaptations are compatible with the biological repertoire of animals. Catfish, for example, can be kept at a wide range of densities, other species cannot. Adaptability is not just about what we ask of animals, but also about what animals ask of one another. Think, for instance, of hierarchy.

Ability to adapt defined

Depending on the particular context, definitions of the ability to adapt may vary, not excepting the reports of the RDA. At this point, the Council defines the ability to adapt as follows:

The ability to adapt is the ability animals and groups of animals possess to respond adequately, both physiologically and in terms of behaviour, and with minimal loss of welfare and health, to changing circumstances.

2.6. Integrity

Whether protection of animal welfare suffices as an evaluation metric for how we should deal with animals, remains debatable. For example, the issue of animal welfare does not necessarily enter into the genetic modification of animals. This is why the legislator draws attention to the integrity of the animal, a notion which may lack a clear scientific component. 'It concerns the physical and mental abilities an animal needs to "come into its own"' (Musschenga, 2009). This is about more than its ability to adapt. The idea is that an animal can be harmed even when its subjective well-being is not at stake. For this reason the notions 'integrity' and 'specific nature' have been included in the Animal Law (Wet dieren) of 2013. Integrity of the animal is to be understood as 'the intact entirety and completeness of an animal and its ability to subsist independently in an environment befitting its species.' (Rutgers and Heeger, 1999) (RDA, 2015a)

The RDA has stated in the past that the integrity of an animal is compromised if it has lost characteristics that are essential to its species (RDA, 2016). This can happen in a number of ways, for example by physically altering parts of the body or their functionality by trimming pig tails or bird beaks, or by genetic modification. It is the same with changing behaviour or mental dispositions, whether or not specific to the species, by breeding out characteristics like fear or aggression.

Virtually all interventions which are not at least partly in the interest of the animal can be considered detrimental to its integrity. This is not to say that such interventions always cause a persistent deterioration of the welfare of the animal, sometimes they even prevent other welfare problems from occurring (RDA, 2016). Although trimming pig tails and hen beaks causes transient pain and discomfort, it prevents more serious damage by maladaptive behaviour as long as the true causes of tail biting and feather pecking have not been properly dealt with.

It is important to keep the concepts integrity and welfare well apart, in order to prevent their being used for covering up welfare problems. Nor would it do, on the other hand, to formulate breaches of integrity in terms of welfare. Separating a cow from her calf constitutes in all likelihood a violation of the integrity of both — the calf becomes more dependent on humans, the cow is hampered in performing her natural behaviour. Whether or not the welfare of either suffers as well, is immaterial in this respect.

Breaches of integrity may give rise to public protests, as when people feel that animals can no longer follow their natural instincts in a natural way and so are prevented from leading a full, worthy life. Physical adaptations may be deemed perverse and considered a loss of characteristics of an animal or species. The debate on where there are limits,

what properties of animals are essential and which violations are acceptable, is ongoing. It is the opinion of the Council that it would be unwise to purposely push infringing upon the integrity of animals to its limits. The Council also opposes any breach of integrity in order to alter an animal's looks for merely aesthetic reasons.

Relation of specific nature to integrity

The terms integrity and specific nature are often used together (see also section 2.2). Specific nature is not a well defined concept. Roughly, it can be interpreted in three ways:

1. In terms of independence and self-determination: From this angle, specific nature is more or less equivalent to autonomy. People express their specific nature through making choices and behaviour. To a presumably limited extent animals make independent choices too. Preventing an animal to go through behaviour and make choices that express its specific nature constitutes a breach of its integrity.
2. In terms of the telos-concept: This is how, to give an example, Bernard Rollin further developed the philosophical underpinnings of the welfare approach. Here, an animal's specific nature or telos is that which makes it into what it is. It is what defines a pig as a pig and a chicken as a chicken. This is not a notion that can be objectified in full, but one can say, for instance, that is it not "like a pig" not to have a tail anymore, not to be able to root and to spend your days apathically lying down eating, even if you grow at normal rates and are healthy.
3. In terms of 'a good of its own': Following Taylor (1986) we might claim that all living creatures have 'a good of their own.' This 'good' can be defined in terms of specific nature. Taylor's biocentric view entails that any such creature has intrinsic value and therefore interests that must be respected.

Integrity defined

Depending on the particular context, definitions of integrity may vary, not excepting the reports of the RDA. At this point, the Council defines integrity as follows:

The integrity of an animal comprises its intact entirety and completeness as specific to its species, and its ability to subsist independently in an environment befitting its species.

3. Reflection on earlier advisory reports

3.1. Consistency of terminology

The annex comprises a reflection on three earlier RDA advisory reports (Fokkerij en Voortplantingstechnieken (2016); Grip op Ingrepen (2013); Zorgplicht Natuurlijk Gewogen (2012)), to answer the following questions:

- 1) How do the notions covered by the present conceptual framework enter into these reports?
- 2) Were these notions instrumental in reaching the conclusions of the reports?
- 3) Were these notions employed in a consistent way? And if not, for what reasons?

It transpired that:

- Recognition of the intrinsic value of the animal is fundamental to all three as a guiding principle;
- Reports differ as to which of the other notions play a role and to what extent;
- Some notions figuring in the conceptual framework at hand do not figure in all three reports, notably integrity and the ability to adapt. The specific nature concept hardly comes into any of them;
- Definitions of concepts vary between reports as well as within them. Why previously established definitions are not adhered to remains unclear, as do the ways notions relate to each other;
- How notions enter into a particular report depends on its subject matter.

3.2. Function and status of the conceptual framework

The conceptual framework is intended as a set of guidelines for improving consistency between reports. This is about more than just definitions, it stimulates conscious reflection on the role of each particular notion in the preparation of each report. It also helps in accounting for deviations from established definitions and in clarifying which notions are instrumental, and why.

In first preparing a report, the schema of Figure 1 in Section 1 may serve to ensure that all the notions are expressly considered and allotted their proper place. This way, values pertinent to a subject can be included and weighed on the basis of the intrinsic value of the animal and the ensuing moral responsibility.

3.3. Relation to RDA assessment framework(s)

The notions of the conceptual framework further specify some of the values and interests that partly or wholly figure in the *Agenda voor het dierbeleid* (RDA, 2010) and in the advisory report *One Health, een afwegingskader voor beleidsbeslissingen* (RDA, 2015b). The animal and its intrinsic value are key here. The conceptual framework specifies those values and related notions which the RDA considers important to the animal and ethical considerations affecting it. In doing so, it helps to ensure that the values and interests of animals are consistently factored in in all cases.

4. Conceptual framework animal welfare

In its documents the Council on Animal Affairs (RDA) will henceforth adhere to the following definitions. In case of exceptions it will be explained how and why.

Intrinsic value

The term intrinsic value refers to the value inherent in an animal, irrespective of its utility. Respecting this inherent value means factoring in the interests of animals in all decisions that affect them. Specifically, there is a moral obligation for human intervention not to cause structural or serious damage to the welfare, health or integrity of animals or their habitat.

Animal welfare

'Animal welfare is the quality of life experienced by the animal.' (Bracke et al., 1999) An animal experiences a positive state of being if it is free to perform normal patterns of behaviour specific to its species and can respond adequately to the challenges posed by its environment.

Natural behaviour

Natural behaviour is the behaviour which members of a species perform under (semi-)natural conditions, because it furthers their biological functioning.

Ability to adapt

The ability to adapt is the ability animals and groups of animals possess to respond adequately, both physiologically and in terms of behaviour, and with minimal loss of welfare and health, to changing circumstances.

Integrity

The integrity of an animal comprises its intact entirety and completeness as specific to its species, and its ability to subsist independently in an environment befitting its species.

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Appendix 1 Detailed reflection

Notions in the advisory report	Duty of Care, Naturally (2012)	Getting a Grip on Intervention (Grip op ingrepen) (2013)	Breeding and Reproductive Technologies (2016)
Intrinsic value	"The intrinsic value of an animal refers to the value of the qualities of an individual as well as to the species itself, irrespective of any value that the individual or species might have for humankind"	"Finally, we acknowledge that animals have intrinsic value: the animal has a value in and of itself, and not only because it is of utility to people"	"that is, a value in and of itself independent of any possible use to humans"
Animal-welfare	<p>"An animal is in a positive state of welfare if it has the freedom adequately to react to hunger, thirst and inappropriate food; thermal and physical discomfort; injury and disease; and anxiety and chronic stress. In addition, it must have the freedom to display normal species-specific behaviour, which enables the animal successfully to adapt to prevailing environmental challenges, so that the animal reaches a state that it experiences as positive"</p> <p>Also, in the glossary of definitions welfare is listed as follows:</p> <p>"Welfare describes an internal state of an individual, as experienced by that individual. This state of welfare is the result of the individual's own characteristics, as well as the environmental conditions to which the individual is exposed. Human determination of an animal's state of welfare is only as good as the observer's perception of the signals that the animal emits. A negative state of welfare is perceptible via reactions that are aimed at changing the existing situation. A positive state of welfare is perceptible via reactions aimed at keeping the existing situation as it is";</p>	"Animal welfare is the result of a dynamic interplay between an animal and its environment. Herein, the animal's state of welfare is linked to the degree to which it can adapt to prevailing environmental challenges and the freedom it has to exhibit normal, species-specific behavioural patterns, in order to reach a state that it experiences as positive. Negative and positive well-being represent extremes on a sliding scale, comparable to being healthy or being ill"	"An animal is in a good state of welfare if it is capable of adapting to its living environment and achieving a state of being that it perceives as positive"
Natural behaviour	" The natural behaviour of wild animals is the result of an evolutionary selection process. The behaviour of wild animals is therefore adapted to the possibilities and limitations of their natural living environment. For domesticated animal species (and animal breeds), however, it may be difficult to define the 'natural' living environment, because their corresponding wild equivalents may not necessarily provide a proper reference. Nonetheless, studies have shown that for many domesticated animal species, the complete behavioural repertoire of the wild predecessors is still present in a latent state, and it quickly resurfaces when the animal is put in a semi-natural environment ".	Natural behaviour is mentioned once but remains undefined. An animal's freedom to show patterns of behaviour normal for its species is included in the definitions of animal welfare and integrity.	The advisory report does not consider natural behaviour. However, it does address the issue of species-specific behaviour, which is equated with the animal's specific nature: "Through natural selection, animals have evolved over

	No further specification of natural behaviour is given. Species-specific patterns of behaviour are subsumed under animal welfare.		millions of years into organisms equipped with behaviour that, given their natural living environment, best enables them to pass on hereditary traits to future generations”.
Adaptive Capacity	<p>“Adaptive Capacity =Predisposition + Experience + Environmental Conditions. An individual’s adaptive capacity is determined by the interplay of its genetic background, acquired characteristics and environmental factors. This interplay is dynamic in nature, because the individual itself goes through changes (for example, by aging and previous experiences), and because environmental factors may undergo profound changes as well. Assuming the existence of (genetically determined) innate capabilities, the adaptive capacity of the animal will be put under increasing pressure as the constraints imposed by environmental factors increases. This results in a greater risk of compromised welfare to the animal due to its ability to adapt being exceeded.”.</p> <p>The glossary of definitions adds:</p> <p>“The adaptive capacity describes the set of innate (physical and mental) abilities with which an animal species is naturally endowed and which an individual develops in the course of its own existence. The species-specific abilities form a basis, which is refined and developed in each individual. The adaptive capacity of an individual is not static; it is dependent on the individual’s internal state as well as on its changing environmental conditions.</p> <p>A group or population has a (collective) adaptive capacity as well, because the capacity of a group to adapt to changing environmental conditions is linked to the interplay of all of the individuals in the group”.</p>	The ability to adapt remains undefined. The report does assess, however, to what degree animals are capable of adapting to interventions which may be detrimental to their welfare.	There is no discussion of the ability to adapt or related notions. On one occasion, possible effects of genetic selection on physiological adaptation are mentioned.
Integrity	There is no mention of either integrity or specific nature.	<p>“ Within the framework of this Opinion, we understand “integrity” to mean the wholeness and soundness of the animal and its ability to display species-specific behaviour”.</p> <p>The animal ’s specific nature is not mentioned.</p>	“The concept of integrity encompasses both wholeness and independence. Hence, a procedure’s effect on an animal’s (residual) independence is pertinent to the

		<p>Integrity is linked to intrinsic value:</p> <p>“The basis for our respect for the integrity of animals lies in this acknowledgement of animals’ intrinsic value: to impair the integrity of an animal is not something that can be easily justified. The view currently held across Dutch society is that people must consider the potential impact of human activities on welfare of animals. That view is founded on the acknowledgement of animals as sentient beings together with the acknowledgement that animals have intrinsic value”.</p>	<p>animal’s integrity”.</p>
<p>Roles in assessment</p>			
	<ul style="list-style-type: none"> - The fundamental recognition of the intrinsic value of animals of any species entails a moral obligation for mankind to factor in their welfare under any circumstances. This principle underlies the assessment framework. - The ability to adapt is a guiding principle, in combination with species-specific behaviour and the animal’s welfare. - Integrity is not addressed. <p>“ The Council recognizes the central role of the adaptive capacity of animals in the concept of animal welfare. If environmental conditions place high or prolonged challenges on the animal’s adaptive capacity, then there is an increasing risk of the animal reaching a state that it experiences as negative, which may be characterized by physical problems, a lack of normal species-specific behaviour and an excess of abnormal behaviour. In its assessments of the quality of animal welfare, the Council therefore takes as its starting point the adaptive capacity of the animal in relation to its living conditions. This also provides the basis for the practical interpretation and fulfilment of our duty of care in relation to the animal”.</p> <ul style="list-style-type: none"> - The assessment framework flowchart in this advisory report starts by asking: is the animal's ability to adapt being overtaxed? If so, and only if so, relevant interventions may be in order. 	<ul style="list-style-type: none"> - Guiding principles are animal welfare and the animal's integrity, which flows from the recognition of intrinsic value. As regards intervention, the primary question is: does it permanently compromise the animal's welfare or integrity? Stage 2 and 3 consider the necessity of intervention for both man and animal. Stage 4 comprises an ethical assessment of the acceptability to society of the intervention and concomitant damage to the animal's welfare and/or integrity. Only acceptable interventions will be carried out. - To a limited extent the ability to adapt and natural behaviour, taken as species-specific behaviour enter into the assessment of interventions. 	<ul style="list-style-type: none"> - The assessment framework is anchored in recognition of the intrinsic value of the animal. - The assessment procedure contains specific questions regarding welfare and integrity, and addresses the other values and interests that are part of the RDA's One Health framework as well, such as intrinsic value. - Natural behaviour, in the sense of behaviour specific to a species and integrity count among the performance indicators of animal welfare. - The ability to adapt is outside the scope of the assessment.